

## REMARKS

This Amendment and Response addresses the final Office action dated December 5, 2006, and is submitted within two months of the mailing date of the final Office action. Accordingly, at a minimum, an Advisory Action is requested. However, for the reasons set forth below, our primary request is for the withdrawal of the finality of the Office action and issuance of a notice of allowance of the claims due to the legal and technical insufficiency of the Shen reference to anticipate independent claims 1, 16, 28, 38, 48, 54 and 62. Claims 16, 23, 25, 28, 30 and 33 are amended, and claims 22 and 29 are canceled. Accordingly, after entry of this Amendment and Response, claims 1-21, 23-28 and 30-66 remain pending.

### I. Claim Rejections Under 35 U.S.C. § 101

Claims 16-47 are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. Specifically, the independent claims 16, 28 and 38 do not provide practical application that produce a useful, tangible and concrete result. In response, claim 16 is amended to include the limitation “bypassing data of the write type instruction to the read type instruction with register information of the write type instruction” and claim 28 is amended to include the limitation “bypassing data of the subsequent instance of the write type instruction to the current instance of the read type instruction with register information of the subsequent instance of the write type instruction.” Claim 38 already has the limitation “bypassing data from a data source of the current instance of the write type instruction to a data destination of the current instance of the read type instruction.” Independent claims 16, 28 and 38 are directed to statutory subject matter because they produce the tangible result of moving data from a write type instruction to a read type instruction. Therefore, it is respectfully submitted that claims 16-47 are in compliance with 35 U.S.C. § 101 and such indication is respectfully requested.

### II. Claim Rejections Under 35 U.S.C. § 102

Claims 1-3, 10-47, 54-57 and 62-64 are rejected under 35 U.S.C. § 102(a) as being anticipated by Shen et al., “*Modern Processor Design-Fundamentals of Superscalar Processors*,” 2003, McGraw-Hill Higher Education, Beta Edition, Chapter 4, pages 196-202 (hereinafter “Shen”). A proper anticipation rejection requires that each and every limitation of a claim be disclosed in a single prior art reference.

Initially, the rejection of independent claims 1, 16, 28, 38, 48, 54, 58 and 62 is addressed. Independent claim 1 includes the limitation of predicting “aliasing between read

type instructions and write type instructions based at least in part on respective displacements between the read type and write type instructions and on previous detection of respective aliasings between the read type instructions and the write type instructions.” Independent claims 16, 28, 38, 48, 54 and 62 also include a similar limitation. As such, the alias prediction involves detecting read type instructions and write type instructions that are likely to alias based on (1) the displacement between the instructions (e.g., the number of instructions between them) and (2) the previous detection of aliasing of the instructions.

In the context of load bypassing when a load instruction is issued, Shen discloses alias prediction by looking in a store buffer to determine if any of the addresses of previously issued stores still in flight alias with the load instruction address (see *Shen* page 198, first full paragraph). Further, for load forwarding alias prediction, Shen discloses comparing previous store addresses with the load address to determine aliasing and if there are multiple store addresses that alias with the load, then using the most recent store that aliased with the load (see *Shen* page 199, first full paragraph). Shen does not base alias prediction on displacement between instructions. Further, Shen does not store information about any previous aliasing between instructions.

The Office action relies on Figure 4-43 of Shen to teach alias prediction based on displacement. The Office action alleges that the Figure discloses aliasing of load and store instructions that exist in a loop. The Applicant asserts that Figure 4-43 of Shen at most teaches the concept of moving a load ahead of a store (load bypassing) and forwarding store data directly to the load instruction (load forwarding). This has nothing to do with alias prediction based on a displacement. As such, Shen only discloses the use of memory addresses to predict aliasing of store and load instructions.

Further, the Office action alleges that Shen teaches previous detection of respective aliasings by observing repeated aliasing such as the load and store instructions existing in a loop as shown in Figure 4-43. The Applicant respectfully disagrees. At most Shen teaches the use of a store buffer and a load buffer to look for prior instructions contained in the buffers that alias with the current instruction being issued. Each time the particular instruction is encountered in the loop, the buffer is checked for aliasing instructions. That is, Shen has no memory of whether or not a particular instruction has been observed to alias with another instruction. Therefore, Shen does not teach previous detection of respective aliasings between read type instructions and write type instructions as required by the independent claims.

Thus, Shen does not disclose predicting aliasing between read type instructions and write type instructions based at least in part on respective displacements between the read type

and write type instructions and on previous detection of respective aliasings between the read type instructions and the write type instructions as required by independent claim 1 and does not disclose the similar limitations as required by independent claims 16, 28, 38, 48, 54 and 62. As such, Shen is insufficient to anticipate independent claims 1, 16, 28, 38, 48, 54 and 62 and such indication is respectfully requested.

The remaining rejected claims 2-3, 10-15, 17-21, 23-27, 30-37, 39-47, 49-53, 55-57 and 63-64 all depend, either directly or indirectly, from one of independent claims 1, 16, 28, 38, 48, 54, and 62. Accordingly, these dependent claims are themselves patentable over Shen for at least the reasons set forth above and such indication is respectfully requested. This statement is made without reference to or waiving the independent bases of patentability within each dependent claim.

### III. Allowable Subject Matter

The Examiner is thanked for the indication that claims 58-61 are allowed and that claims 4-9, 65 and 66 would be allowable if rewritten in independent form. At this time claims 4-9, 65 and 66 have not been amended herein to be written in independent form. For the above disclosed discussed reasons with regard to independent claims 1 and 62, from which claims 4-9, 65 and 66 depend, it is believed that these claims are in form for allowance without amendment and such indication is requested. Applicant reserves the right to amend claims 4-9, 65 and 66 in independent form at a later date.

### VI. Conclusion

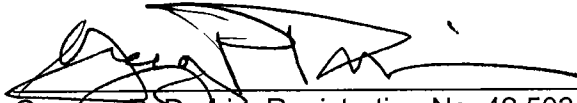
The Applicant thanks the Examiner for his thorough review of the application. In view of the above, claims 1-21, 23-28 and 30-66 remain in the application, with claims 1, 16, 28, 38, 48, 54, 58 and 62 being independent claims. This Amendment and Response is submitted within the two month time frame for receiving an advisory action. The application, as amended, is believed to be in condition for allowance, and the issuance of a Notice of Allowability as soon as practicable is requested. At a minimum, we request withdrawal of the final rejection and further consideration on the merits of claims 1-21, 23-28 and 30-66.

The Applicant believes no fees or petitions are due with this filing. However, should any such fees or petitions be required, please consider this a request therefor and authorization to charge Deposit Account No. 04-1415 as necessary.

If the Examiner should require any additional information or amendment, please contact the undersigned attorney.

Dated: 5 FEB 2007

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Gregory P. Durbin', written over a horizontal line.

Gregory P. Durbin, Registration No. 42,503  
Attorney for Applicant  
USPTO Customer No. 66083

DORSEY & WHITNEY LLP  
Republic Plaza Building, Suite 4700  
370 Seventeenth Street  
Denver, Colorado 80202-5647  
Phone: (303) 629-3400  
Fax: (303) 629-3450